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10/019,125	05/10/2002	Yasuharu Asano	450101-03685	9907

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EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>17 September 2008</u>.

2a)☐ This action is FINAL.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
      closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>10 May 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☒ All   b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
              application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the office action from 9/11/2008, the applicant has submitted a Request for

Continued Examination, filed 9/17/2008, amending independent claims 1 and 8-9 to specify that

the candidate second words are selected not based on the acoustic score and have unstable

acoustic characteristic values with a number of phonemes less than a preset value, while arguing

to traverse the art rejection based on this added limitation *(Amendment, Pages 9-11)*. The

applicant's arguments have been fully considered but are moot with respect to the new grounds

of rejection in view of Doyle *("Progressive Word Hypothesis Reduction for Very Large*

Vocabulary Continuous Speech Recognition," 1997).

Claim Objections

2.   **Claims 2-4** are objected to under 37 CFR 1.75(c), as being of improper dependent form

for failing to further limit the subject matter of a previous claim. Applicant is required to cancel

the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the

claim(s) in independent form. Claim 2 specifies that a number of phonemes is the non-acoustic

candidate measure, which is already recited in claim 1, while claims 3-4 recites different

alternative measures for candidate selection when the number of phonemes has already been set

forth as the measure used in claim 1. Thus, these claims fail to further limit their parent claims.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   **Claim 1-2 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Higgins et al *(U.S. Patent: 5,218,668)* in view of Doyle *("Progressive Word Hypothesis*

Reduction for Very Large Vocabulary Continuous Speech Recognition," 1997).

With respect to **Claims 1 and 8**, Higgins discloses:

Extraction means for extracting characteristic values of said input speech, the input

speech comprising a plurality of input words *(speech parameter extraction, Col. 5, Lines 45-63;*

and input speech corresponding to a word sequence, Col. 6, Lines 16-46);

Selection means for selecting one or more candidate first words from the plurality of

input words to be processed by speech recognition processing, based on a word score that

represents an evaluation of acoustic scores and language scores calculated using said

characteristic values *(determining a first word hypothesis set based on a matching algorithm*

utilizing a keyword template, Col. 4, Lines 49-66; Col. 6, Lines 16-46; and syntax language

models, Col. 8, Lines 18-26), and for selecting one or more candidate second words from the

plurality of input words based on a second measure different from said first measure

(determining a second word hypothesis set based on a matching algorithm utilizing a filler

template relating to keywords, Col. 4, Lines 49-66; and Col. 6, Lines 16-46);

Score calculation means for calculating said score of said candidate first and candidate

second words selected by said selection means referencing concatenation information of said

first and second words *(scoring a template string from a concatenation of partial strings of*

existing candidates located in a phrase buffer with current template candidates, Col. 6, Lines 16-

46; and Col. 8, Line 9- Col. 9, Line 65); and

Finalizing means for finalizing a words string, as the recognition result of said speech

based on said score *(finalized recognition output corresponding to a string of most likely word*

templates, Col. 6, Lines 63-67; and finalizing phrase recognition, Col. 9, Lines 26-54), wherein

the word concatenation information is sequentially updated based on the score *(accumulating*

scores for partial strings by further concatenating candidates for a current frame to the existing

partial strings to produce an updated score, Col. 6, Lines 16-46).

Although Higgins teaches the selection of alternative speech recognition candidates

corresponding to smaller speech units, Higgins utilizes an acoustic distance algorithm in order to

make such a selection and not a non-acoustic selection of candidate words having unstable

acoustic characteristic values with a number of phonemes less than a preset value. Doyle,

however, teaches the automatic selection of candidate words having acoustically unstable

constituents *(i.e., the shortness of the word contributes to acoustic matching inaccuracy because*

missing phonemes are more costly) from a defined set of short words having a low number of

phonemes *(i.e., the word "the" consisting of 2 phonemes and see short word list, Section 4.11,*

Pages 39-40) based on an assigned boosting amount, without which the short words would not

be selected or missed as candidates *(Section 4.11, Pages 37-40)*.

Higgins and Doyle are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the short word selection means taught by Doyle in order to prevent short words from being lost from consideration in a speech recognition process *(Doyle, Section 4.11, Page 37).*

With respect to **Claim 2,** Doyle further discloses:

A means for a non-acoustic ranking and selection of phoneme recognition candidates in a word through a phoneme misrecognition count (*short word selection is based upon words with a small number of phonemes, Section 4.11, Pages 37-40).*

With respect to **Claim 7,** Higgins recites:

The selection means calculates said score using characteristic values of the speech to select said first word based on said score *(extracted speech parameters used in keyword template matching, Col. 5, Lines 45-63; and Col. 6, Lines 16-21).*

5.   **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Doyle and further in view of Chiang et al *("On Jointly Learning the Parameters in a Character-Synchronous Integrated Speech and Language Model," 1996).*

With respect to **Claim 3,** Higgins in view of Doyle teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not teach the use of an alternative hypothesis scoring means related to related to a part-of-speech,

however Chiang teaches an HMM based recognizer that utilizes part-of-speech tags in scoring to

determine a best recognition hypothesis *(Page 168, Fig. 1)*.

Higgins, Doyle, and Chiang are analogous art because they are from a similar field of

endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill

in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the

scoring means related to a part-of-speech tag as taught by Chiang in order to achieve an

alternative recognition measure having an improved recognition rate and a reduced error rate

(Chiang, Page 168).

6.   **Claims 4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins

et al in view of Doyle and further in view of Franz et al *(U.S. Patent: 6,178,401)*.

With respect to **Claim 4**, Higgins in view of Doyle teaches the speech recognition system

utilizing keyword and alternative model matching to generate candidate hypotheses in

recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not

teach the use of an alternative hypothesis scoring means related to a linguistic likelihood,

however Franz discloses the use of a language model that determines a score based on linguistics

(Col. 6, Line 42- Col. 7, Line 6).

Higgins, Doyle, and Franz are analogous art because they are from a similar field of

endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill

in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the

scoring means related to a linguistic likelihood as taught by Franz in order to provide an

alternative recognition means that enhances the probability of selecting a correct recognition

candidate *(Franz, Col. 6, Line 61- Col. 7, Line 6)*.

      With respect to **Claim 9**, Higgins in view of Doyle teaches the speech recognition

method, as applied to claim 8, while Franz further recites implementing a speech recognition

method as a program stored on a computer readable medium to enable method implementation

on one or more general purpose computers *(Col. 2, Lines 42-67)*.

7.   **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in

view of Doyle and further in view of Holt et al *(U.S. Patent: 5,960,447)*.

      With respect to **Claim 5**, Higgins in view of Doyle teaches the speech recognition system

utilizing keyword and alternative model matching to generate candidate hypotheses in

recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not

teach the use of a storage means for memorizing speech recognition results and using the results

in a subsequent alternative recognition, however Holt discloses a means for storing a confidence

score from a recognition engine for use in a speech recognition process *(Col. 9, Lines 7-61)*.

      Higgins, Doyle, and Holt are analogous art because they are from a similar field of

endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill

in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the

confidence score storage means taught by Holt in order to provide an improved alternative

speech recognition means for editing and correcting speech recognition results *(Holt, Col. 1, Line

65- Col. 2, Line 21)*.

      With respect to **Claim 6**, Holt further recites:

Inputting means for providing an input for correcting the results of speech recognition;

wherein said storage means stores the results of the speech recognition corrected by the input

from said inputting means *(editing a recognition result and updating a confidence score, Col. 9,*

Lines 36-61).

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

Quinton *("A Syntactic Analyzer Adapted to Speech Recognition," 1976)*- teaches the non-

acoustic selection of short words less than two phonemes *(Page 455, column 1).*

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/James S. Wozniak/
Patent Examiner, Art Unit 2626